



ENVIRONMENTAL PROTECTION AGENCY

[EPA-HQ-OAR-2009-0927; FRL-9626-8]

Mandatory Reporting of Greenhouse Gases: Notice of Preliminary Determinations Regarding Requests to Use Provisional Global Warming Potentials Under the Fluorinated Gas Production Category of the Greenhouse Gas Reporting Rule

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of data availability and request for comment.

SUMMARY: The EPA is announcing and explaining to the public its preliminary determinations regarding requests to use provisional global warming potentials for eight fluorinated greenhouse gases submitted by DuPont de Nemours, Inc. and Honeywell International for purposes of certain calculations in the Fluorinated Gas Production portion of the Mandatory Greenhouse Gas Reporting Rule. EPA's preliminary determination is that the requests for seven of the eight fluorinated GHGs meet the requirements of the rule.

DATES: Comments must be received on or before [INSERT THE DATE 15 DAYS AFTER THE DATE OF PUBLICATION OF THIS NOTICE IN THE FEDERAL REGISTER].

ADDRESSES: Submit your comments, identified by Docket ID No. EPA-HQ-OAR-2009-0927, by one of the following methods:

- Federal eRulemaking Portal: <http://www.regulations.gov>: Follow the online instructions for submitting comments.
- Email: GHGReportingRule@epa.gov.
- Fax: (202) 566-1741.
- Mail: EPA Docket Center, Attention Docket OAR-2009-0927, Mail code: 2822T, 1200 Pennsylvania Avenue, NW, Washington, DC 20460.
- Hand Delivery: EPA Docket Center, Public Reading Room, Room 3334, EPA West Building, Attention Docket EPA-HQ-OAR-2009-0927, 1301 Constitution Avenue, NW, Washington, DC 20004. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. EPA-HQ-OAR-2009-0927. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at <http://www.regulations.gov>, including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through <http://www.regulations.gov>. The <http://www.regulations.gov> website is an "anonymous access" system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through <http://www.regulations.gov> your email address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the

Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD-ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses.

Docket: All documents in the docket are listed in the <http://www.regulations.gov> index. Although listed in the index, some information is not publicly available, e.g., CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in <http://www.regulations.gov> or in hard copy at EPA's Docket Center, Public Reading Room, EPA West Building, Room 3334, 1301 Constitution Avenue, NW, Washington, DC 20004. This Docket Facility is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The Docket telephone number for the Public Reading Room is (202) 566-1744 and the telephone number for the Air Docket is (202) 566-1742.

FOR FURTHER INFORMATION CONTACT: Deborah Ottinger, Climate Change Division, Office of Atmospheric Programs (MC-6207J),

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SUPPLEMENTARY INFORMATION:

I. General Information

A. Does this notice apply to me?

This notice applies to five facilities considered to be fluorinated gas production facilities under subpart L (Fluorinated Gas Production) of the Mandatory Greenhouse Gas Reporting rule (40 CFR part 98). These facilities are Honeywell International's Buffalo Research Laboratory and DuPont's Fayetteville, North Carolina; Deepwater, New Jersey; Washington Works, West Virginia; and Eldorado, Arkansas facilities. This notice may also be of interest to members of the public with knowledge of or interest in the estimation of global warming potentials.

B. What is this notice about?

This notice announces and explains to the public EPA's preliminary determinations regarding the provisional global warming potentials (GWPs) for eight fluorinated greenhouse gases (GHG) submitted by E. DuPont de Nemours, Inc. (DuPont) and Honeywell International (Honeywell) for the purposes of the calculations in 40 CFR 98.123(c)(1) (a provision of subpart L of the Mandatory Greenhouse Gas Reporting rule). EPA's preliminary

determination is that the requests for seven of the eight fluorinated GHGs meet the requirements of the rule. As discussed further below, the calculations in 40 CFR 98.123(c)(1) are used to determine whether a facility must use stack testing to establish an emission factor for a continuous process vent. For continuous process vents that are calculated to emit less than 10,000 metric tons carbon-dioxide equivalent (mtCO₂e) annually, facilities have the option to use engineering calculations rather than stack testing to establish an emission factor.

C. What information is EPA making available for review and comment?

EPA is making available for review and comment provisional GWPs for fluorinated GHGs submitted by Dupont and Honeywell for the purposes of the calculations in 40 CFR 98.123(c)(1). EPA is also making available to the public the underlying materials in the submitted requests that were used to estimate the provisional GWPs, and EPA's analysis of those materials.

D. Where can I get more information?

All of the information can be obtained through the Docket and at <http://www.regulations.gov> (see ADDRESSES section above for docket contact information).

E. Submitting Confidential Business Information (CBI).

Do not submit information you are claiming as CBI to EPA through <http://www.regulations.gov> or email. Clearly mark the

part of the information that you claim to be CBI. Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2. For CBI information in a disk or CD ROM that you mail to EPA, mark the outside of the disk or CD ROM as CBI and then identify electronically within the disk or CD ROM the specific information that is claimed as CBI. In addition to one complete version of the comment that includes information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket.

II. Background

Under 40 CFR 98.123(c)(1), fluorinated gas producers that wish to use 40 CFR 98.123(c) (the Emission Factor Method or Emission Calculation Factor Method) to estimate emissions from a continuous process must make a preliminary estimate of the annual carbon dioxide equivalent (CO₂e) emissions of fluorinated GHGs from each process vent. They are required to do so using the engineering calculations or assessments specified in the rule. If the preliminary estimate indicates that a vent emits 10,000 mtCO₂e or more annually, facilities must use stack testing to establish an emission factor for that vent. If the preliminary estimate indicates that a vent emits less than 10,000 mtCO₂e annually, facilities may use engineering

calculations or assessments to establish an emission calculation factor.

Under 40 CFR 98.123(c)(1)(v), to convert the fluorinated GHG emissions to CO₂e, fluorinated gas producers must use Equation A-1 of 40 CFR 98.2. For fluorinated GHGs whose GWPs are not listed in Table A-1 to subpart A of part 98, producers must use a default GWP of 2,000 unless they submit a request to use other GWPs for those fluorinated GHGs in that process under 40 CFR 98.123(c)(1)(vi), and EPA approves that request.

Under 40 CFR 98.123(c)(1)(vi), fluorinated gas producers may submit a request to use a GWP other than 2,000 for fluorinated GHGs whose GWPs are not listed in Table A-1 to subpart A if their process vent emits one or more fluorinated GHGs (1) whose GWPs are not listed in Table A-1 to subpart A, (2) that are emitted in quantities that, with a default GWP of 2,000, result in total calculated annual emissions equal to or greater than 10,000 metric tons CO₂e for the vent, and (3) that they believe have GWPs that would result in total calculated annual emissions less than 10,000 metric tons CO₂e.

Under 40 CFR 98.123(c)(1)(vi)(B), EPA reviews each request to determine whether it is complete, substantiates each of the provisional GWPs, and demonstrates that the process vents are calculated to emit less than 10,000 metric tons CO₂e of fluorinated GHGs only when the proposed provisional GWPs, not

the default GWP of 2,000, are used for the fluorinated GHGs for which the provisional GWPs are requested. If EPA makes a preliminary determination that each of these criteria is met, EPA publishes a notice for public comment including the determination and the data and analysis submitted by the producers under 40 CFR 98.123(c)(1)(vi)(A)(1) through (3).

Under 40 CFR 98.123(c)(1)(vi)(A)(1) through (3), fluorinated gas producers must include the following information in the request for each fluorinated GHG that does not have a GWP listed in Table A-1 to subpart A of part 98 and that constitutes more than one percent by mass of the stream emitted from the vent:

- (1) The identity of the fluorinated GHG, including its chemical formula and, if available, CAS number.

- (2) The estimated GWP of the fluorinated GHG.

- (3) The data and analysis that supports the estimate of the GWP of the fluorinated GHG, including:

- (i) Data and analysis related to the low-pressure gas phase infrared absorption spectrum of the fluorinated GHG.

- (ii) Data and analysis related to the estimated atmospheric lifetime of the fluorinated GHG (reaction mechanisms and rates, including for example, photolysis and reaction with atmospheric components such as hydroxyl radicals (OH), ozone (O₃), carbon monoxide (CO), and water).

(iii) The radiative transfer analysis that integrates the lifetime and infrared absorption spectrum data to calculate the GWP.

(iv) Any published or unpublished studies of the GWP of the gas.

A. Requests to Use Provisional GWPs

On February 25, 2011, Honeywell requested to use provisional GWPs for two fluorinated GHGs for the purposes of the calculations in paragraph (c)(1) of 40 CFR 98.123. Honeywell requested to use provisional (i.e., lower) GWPs for two commercial chemicals produced at their Buffalo Research Laboratory: HFC-1234ze and HFC-1234yf. Honeywell included published scientific papers and other information to fulfill the requirements under paragraphs (c)(1)(vi)(A)(1) through (3) of 40 CFR 98.123.

On February 28, 2011, DuPont requested to use provisional GWPs for six fluorinated GHGs for the purposes of calculations in 40 CFR 98.123(c)(1). DuPont requested to use provisional (i.e., lower) GWPs for six chemicals at DuPont plant sites subject to subpart L: hexafluoropropylene (HFP), perfluoromethyl vinyl ether (PMVE), tetrafluoroethylene (TFE), 3,3,3-trifluoropropene (TFP), vinyl fluoride (VF), and vinylidene fluoride (VF₂). For each chemical, DuPont included peer-reviewed

scientific data and other information to fulfill the requirements under paragraphs (c)(1)(vi)(A)(1) through (3).

B. Preliminary determinations and their rationale

In accordance with 40 CFR 98.123(c)(1)(vi)(B), EPA reviewed the requests from both Honeywell and DuPont to determine whether each was complete, substantiated each of the provisional GWPs, and demonstrated that the process vents were calculated to emit less than 10,000 metric tons CO₂e of fluorinated GHGs only when the proposed provisional GWPs, not the default GWP of 2,000, were used for the fluorinated GHGs for which the provisional GWPs were requested.

EPA made a preliminary determination that each of these criteria was met for the requests submitted by both Honeywell and DuPont, with one exception. The exception was for HFC-1234yf, which was emitted in quantities that, with a default GWP of 2,000, resulted in total calculated annual emissions of less than 10,000 mtCO₂e. Because the calculated emissions did not meet the threshold criterion, EPA is not evaluating the provisional GWP for HFC-1234yf in this action. EPA notes, however, that the provisional GWP submitted by Honeywell is the same as the GWP recognized in other EPA final actions (e.g., March 29, 2011; 76 FR 17488). EPA will consider this information in future updates to Table A-1 of 40 CFR Part 98.

The remainder of this section includes a summary of the determination and the data and analysis submitted by the producers under 40 CFR 98.123(c)(1)(vi)(A)(1) through (3).

EPA's preliminary determination included review of the submitted information by a leading subject matter expert on GWP estimation who was also a co-developer of the GWP concept. EPA concluded that the methods overall were likely to overestimate GWPs (maybe by an order of magnitude or more) rather than underestimate them. Because 40 CFR 98.123(c)(1) allows the use of engineering calculations only when estimated emissions fall below 10,000 metric tons CO₂e, an overestimated GWP is considered acceptable by EPA in the context of 40 CFR 98.123(c)(1). Therefore, the conclusion of EPA's review was that the background information was adequate and that it justified the use of the alternative GWPs in the context of 40 CFR 98.123(c)(1)(vi).

The overestimation of the GWPs submitted by both Honeywell and DuPont results from the fact that the commonly-used estimation techniques employed in the analyses cited by both companies use simplifying assumptions that are not fully applicable to compounds that are short-lived in the atmosphere—defined here as any compound with an atmospheric lifetime less than 1 year. (All of the compounds for which provisional GWPs were requested are short-lived based on this definition.)

Essentially, the estimation techniques assume that the compounds are well-mixed in the atmosphere, but short-lived compounds do not last long enough to become well mixed (i.e., spread evenly over all longitudes, latitudes, and altitudes). Instead, their concentrations decrease rapidly with distance from their emission point, particularly with changing latitude and altitude.

The assumption that the compounds are well mixed affects the estimates of both of the primary components of GWPs: atmospheric lifetime and radiative forcing. In the analyses cited by the companies, atmospheric lifetimes are estimated either by assuming that the short-lived compound is exposed to the global average concentration of hydroxyl radicals (OH) or by deriving the lifetime of the short-lived (i.e., not well mixed) compound from the known lifetime of a long-lived (i.e., well mixed) reference compound based on the compounds' respective reaction rates with OH. Both approaches are likely to overestimate the lifetime (and therefore the GWP) of the short-lived compound because they essentially assume that the concentration of the short-lived compound remains constant with altitude. This overestimates the share of the short-lived compound that resides higher in the atmosphere, where lower OH concentrations, temperatures, and pressures slow reaction rates and lengthen lifetimes. Radiative forcing is also estimated

based on the assumption that the concentration of the short-lived compound remains constant with altitude. This assumption is likely to overestimate the radiative forcing (and therefore the GWP) of short-lived compounds because, again, it overestimates the share of the short-lived compound that resides higher in the atmosphere. GHGs higher in the atmosphere (i.e., near the tropopause) are responsible for more radiative forcing than the same GHGs lower in the atmosphere. (As discussed in the Supporting Analysis, this is related to the fact that temperatures near the tropopause are lower than those at the surface.) Together, these assumptions may result in overestimates of the GWP by a factor of ten or more. The rationale for EPA's preliminary determination is discussed in more detail in the Supporting Analysis, which is available in the docket.

The provisional GWPs are shown in Table 1.

Table 1: Provisional Global Warming Potentials for fluorinated greenhouse gases for which EPA has made preliminary determinations that all approval criteria have been met for the purposes of the calculations in 98.123(c)(1) of subpart L.

Fluorinated GHG	CAS Number	Provisional GWP
HFC-1234ze	29118-24-9	6
Hexafluoropropylene (HFP)	116-15-4	0.25
Perfluoromethyl vinyl ether (PMVE)	1187-93-5	3
Tetrafluoroethylene (TFE)	116-14-3	0.02

Fluorinated GHG	CAS Number	Provisional GWP
Trifluoro propene (TFP)	677-21-4	3
Vinyl fluoride (VF)	75-02-5	0.7
Vinylidene fluoride (VF ₂)	75-38-7	0.9

EPA will review public comment on this notice prior to taking final action on its preliminary determinations. The final determinations will be placed in the docket for this action.

Dated: January 27, 2012.

Sarah Dunham, Director
Office of Atmospheric Programs

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